INSTALLATION AND OPERATING INSTRUCTIONS

Model:

KWL EC 200 Eco R
KWL EC 200 Eco L
with 4-level operation switch

Controlled ventilation system
with heat recovery.

TABLE OF CONTENTS

Thank you that you have decided on Helios ventilation system with heat recovery. Read the information summarised in the operation and installation instruction before the Helios unit is put into operation.

In addition, you will find information about the maintenance and care which serves the proper functioning and conservation of value of your Helios unit.

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GENERAL INFORMATIONS

Important

Important informations

Operation: Important information about the ventilation system as well as settings at the controller are specified here.

Maintenance: In the maintenance part important information about filter changes and necessary cleaning and maintenance activities are specified. The user usually accomplishes maintenance work.

Montage: The chapter “installation” with important installation information and unit base settings addresses itself to professional installers. Read this instruction in any case carefully and completely before you operate, install or connect the ventilation unit. Keep in safe custody!

Planning documents: The planning office provides the necessary planning documents for the system calculation. Additional information can be requested ex works.

Saftey instructions

For safety it is absolutely necessary that the following instructions are thoroughly read and observed.

Receipt

The consignment contains: **KWL EC 200 Eco with control panel**

Please check delivery immediately on receipt for accuracy and damage. If damaged, please notify carrier immediately. Delayed notification may void any possible claim.

Storage

When storing for a prolonged time the following steps are to be taken to avoid damaging influences: protection by dry air and dustproof packing (plastic bags with drying agent and moisture indicators). The storage area must be free of water, vibration and temperature variations.

When storing for years or non rotation of motor an inspection of the bearings with possible replacement and an installation inspection in accordance with VDE 0530 are necessary before starting using the unit. Damage caused by incorrect storage, transportation or installation are not valid warranty claims.

Operation – Use

Compact unit to use in dry indoor areas for ventilation with heat recovery. Suitable as central or decentral solution for commercial or industrial applications. The standard equipment permits the installation and use in frost-protected rooms up to +5 °C.

For operation under difficult conditions, e.g. high humidity, long periods of standstill, high air pollution or through climatic, technical or electronic influences other than standard operations may not be suitable. For this reason please enquire and obtain operation release. A release by a third party is not valid.

Mode of action

In the heat exchanger the cold outside air and the warm extracted air "crosses over" without touching. Through this exchange the energy of the warm air (>90 %) is tranfered to the incoming air. Additionally a thermostat controlled heating element (pre-heating) warms up the inlet air (in extreme cold weather conditions) to the required temperature. The inlet air is directed to the living rooms and bedrooms through ducting and valves. The used air is extracted from the bathrooms, toilets and kitchens. It flows back to the fan via the ducting systems, transfering heat before being released into the open air.

Performance

To achieve the given performance, the unit must be correctly installed. Varying from the design and/or installation requireements and also by incorrect operation can lead to a reduction in the unit capacity. Noise figures are stated in sound power levels LWA in dB(A) (conforms to DIN 44635 T.1). Sound pressure levels LPA depend on room specific conditions. These conditions may affect the measured result on site and vary from the catalogue data.

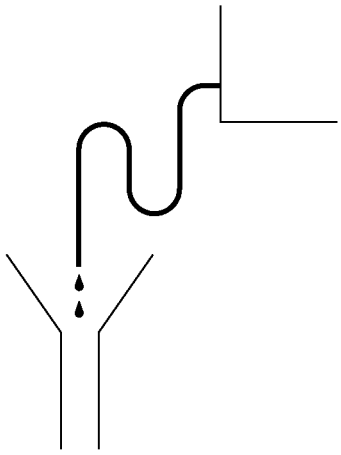
Installation – Assembly

The KWL EC 200 Eco is suitable for „hanging“ arrangement for installation in a cupboard or for installation on a wall and therfore for installation within the room of the dewelling. There are drilled holes for wall installation at the level of the air connecions. For wall installation a support plate to hang the unit on is included. If a wall installation is not possible, the unit can also be fixed through its side panell into the ajoining surface.

When screwing through the side panel, the fans, controler, heating element and electrical wiring must not be damaged or restricted in function. Sound and vibration transfer must be considered on site when installing the unit.

It is necessary to connect the condensation spigot of the unit to a pipe connected to the drainage system of the house with a U bend trap in to prevent oders returning from the drains (see condensation run-off). The condensate pipeing must ensure the effective gravity flow of the condensate water. Tight bends can lead to a high pressure loss and flow noise. A secure and tight connection of the ductwork is required. For maintenance and installation work, the unit must be accessable.

When taking the unit out of the carboard box, the unit must not be stod on the condensation spigot at the bottom of the unit. Therefore lay it on its back to prevent damage, using the polystyrene packing to lay the unit on will ensure the unit will not get scratched. Before installation the operation switch must be taken out of the unit.



Condensing water outlet

Fireplaces

Fire and building regulations must be observed.

Elektrical connections

ATTENTION: Only work with the unit isolated from the electric supply!

Electrical connection is to be carried out only by a qualified electrician, observing the appropriate regulations and guidelines of national bodies and the EVU (e.g. VDE 0100/ DIN57100 T.420) VDE0721, DIN18379). Before maintenace an isolator is required for with a minimum of 3 mm contact opening of each pole. Electrical connection should only be carried out by a qualified person.

Electrical connections are to be made according to wiring diagram in these instructions. Connection in the external terminal box in accordance with the wiring diagram.

Ventilation duct, ventilation line

When designing the ductwork, use the shortest possible runs. Airight connections and change overs must be ensured for the best possible heat recovery. To avoid pressure loss, accumulating dirt, and noise, use smooth ducting (plastic or rigid ducting). For main ducting (outside air, extract air, inlet air, discharge collection) a diameter 160 mm has to be used, for side ducting the diameter ø must be suited reduced.

To reduce condensation in the extract and outside air pipes, the ducting has to be insulated where appropriate. Also if inlet and extract ductwork cross unheated rooms insulation must be provided to reduce heat losses.

Fresh air should be supplied into living and bedrooms, extraction takes place in bathrooms, toilets and kitchens. To balance the whole system the duct connection into the rooms we recommend the use of adjustable valves.

On extract of polluted outside air a filter (accessory) is to be used. It is not allowed to install kitchen hoods to the system (dirt, fire, hygiene). There must be enough air transfer flow between rooms (e.g. door grilles) within the building to guarantee air flow between intake rooms and extract rooms.

IMPORTANT: Fire and building regulations must be observed.

TECHNICAL SPECIFICATION

Main parts

1. Supply air fan
2. Extract air fan
3. Heat recovery cell
4. Heat recovery bypass
5. Plug
6. Outdoor air filter G4
7. Extract air filter G4
8. Supply air filter F7
10. Door switch-/service switch
11. external connection box
12. 4-level operation switch

Optional equipment

13. Differential pressure switch DDS
14. Clock timer WSUP

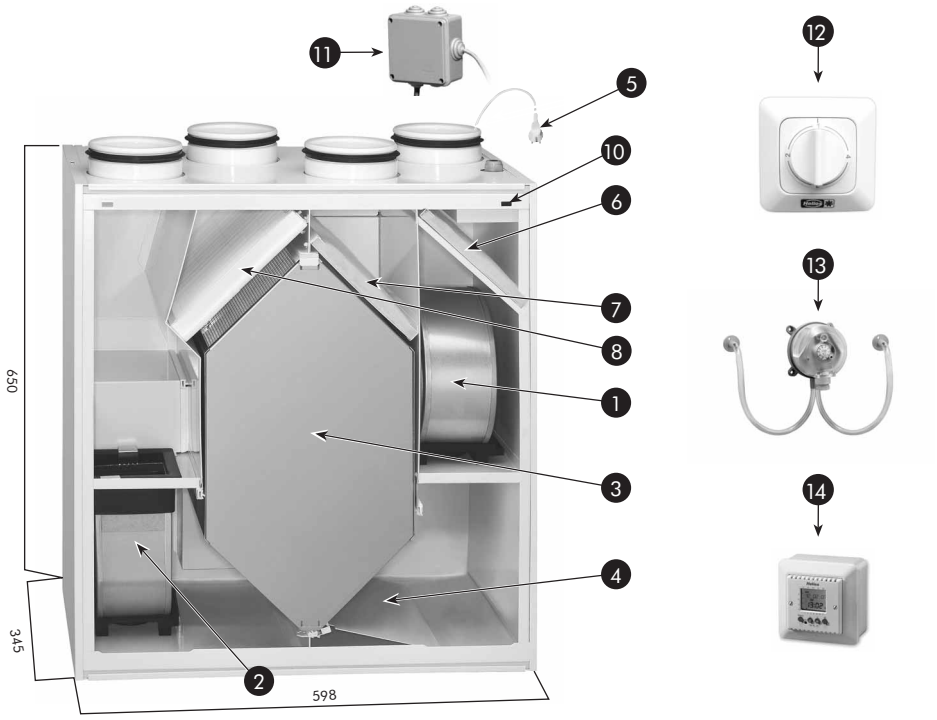
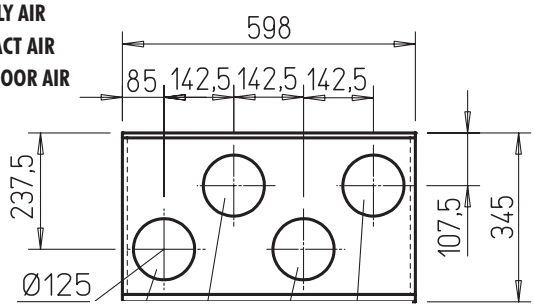


fig: KWL EC 200 R

Power supply		230 V~, 50 Hz / 0,7 A / 98W
Protection class		IP 34
Fans		Supply air 49 W DC
		Extract air 49 W DC
Heat recovery		Counter flow cell
Heat recovery bypass		Summer-/winter automation, manual
Filter	Zuluft	G4
		F7-supply air filter (accessory optional)
	Abluft	G4
Unit KWL EC 200 Eco	Gewicht	40 kg
Control		– Manual control – 4-level operation switch
Accessory optional		– Differential pressure switch DDS

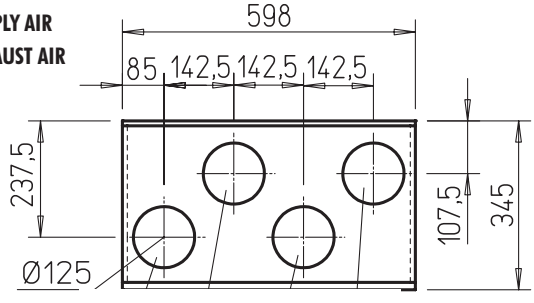
KWL EC 200 Eco R

A EXHAUST AIR
B SUPPLY AIR
C EXTRACT AIR
D OUTDOOR AIR



KWL EC 200 Eco L

A OUTDOOR AIR
B EXTRACT AIR
C SUPPLY AIR
D EXHAUST AIR



Models: KWL EC 200 Eco R / KWL EC 200 Eco L

KWL EC 200 Eco removes contaminated air and replaces it with fresh filtered and heated outdoor air.
Efficient filtering of outdoor air (G4 + F7) prevents harmful particles from entering the duct-work and rooms via the unit. Good filtering of extract air (G4) diminishes the contamination of the unit and ensures proper operation of heat recovery and the extract air fans.

With an effective counter-current heat exchanger, most of the heat of contaminated extract air can be transmitted to outdoor air coming inside. The efficiency of KWL EC 200 Eco depends on the temperature of extract and outdoor air, the humidity content of extract and outdoor air and the air flow volume of extract and supply air. The adjacent examples show the efficiency of supply air in KWL EC 200 Eco in two different sets of circumstances.

The unit has a manual heat recovery bypass function, which eliminates needless heating of outdoor air during summer. The automatic defrosting of the heat recovery cells intermittently stops the supply air fan when the temperature of exhaust air goes under the set threshold value.

The unit KWL EC 200 Eco has an 4-level operation switch and therefore four speed steps.

Case 1.

Extract air flow	**162 m³/h**
Supply air flow	**162 m³/h**
Extract air temperature	**21 °C**
Outdoor air temperature	**-3 °C**
Humidity of extract air	**35%**
Humidity of outdoor air	**90%**
Efficiensy of heat recovery	**82%**

Case 2.

Extract air flow	**235 m³/h**
Supply air flow	**235 m³/h**
Extract air temperature	**21 °C**
Outdoor air temperature	**10 °C**
Humidity of extract air	**57%**
Humidity of outdoor air	**90%**
Efficiensy of heat recovery	**89%**

Selection of fan speed (4-level operation switch)

The 4-level operation switch has following functions:

• Performance regulation of the fans about four speed steps

To switch off the unit KWL EC 200 Eco completly, connect a power switch by customers.

4-level operation switch

Clock timer WSUP (peripheral equipment)

NOTE: Attend seperate Installation- and Operating Instruction! (WSUP/No 91584.001)

Digital clock timter with LCD and factory-set time. Programmabe for all days of the week. The clock timer is adapted for surface and flush mounting in dry rooms.
The weekly programm pilot the lower mode.

Control mode: **On = normal mode**
Off = lower mode

clock timer WSUP

MOUNTING INSTRUCTIONS

1 Hooks on the back side of the unit
2 Wall mounting plate
3 Condensing water outlet below the unit

Mounting – Location of KWL EC 200 Eco

- The unit is mounted indoors, in a place where temperature does not fall below +5 °C.
- If installed within not heated areas (e.g. cock loft) a sufficient isolation on all sides is to be mounted outside at the unit. Otherwise condensate formation at the casing sides could occur. The condensate drainage must be laid frost protected.
- The unit is to be mounted in a place where the sound pressure level coming through the envelope is not acoustically disturbing (utility room, washroom, corridors, technical rooms, stores, and in some cases rooms where people spend time).
- The unit is mounted on the wall using the wall mounting plate included in the delivery. Lift the unit to the wall making sure that the hooks on the back side of the unit attach to the mounting plate.
- The unit is splash protected (IP34), and can thus also be mounted in a damp room.
- NOTE: Remove the transportation lock (wingnut) in the extract duct.
- Before start-up, check the rubber aprons of the motors. They must be fitted correctly.
- NOTE: The unit has to be mounted level with the vertical and the horizontal. (indispensable for a correctly condensat drain).

Duct connections

- The unit has four (diameter125) inner fittings equipped with rubber rings. Fix the ducts steadily and tightly to the outlets. (**NOTE! Unit models L/R**). Implement insulation as defined in the ventilation plan.

Condensing water connection

- Water condensing from extract air going through the unit is removed from the bottom reservoir through a condensing water outlet.
- Condensing water is led through the outlet either to a floor drain or to the wastewater drain. The connection is to be located before the water seal.
- The drain must not rise after the water seal.
- The condensing water outlet is placed in the middle of the unit. The unit must be installed 100 % perpendicular (very important for a correct condensing water drain).

Electrical connections KWL EC 200 Eco

Only an authorized peson may perform the electrical 230VAC 50Hz connections!
An isolator is required for with a minimum of 3 mm contact opening of each pole.

The wire, approximately 1.5 m long, is located on the right side of the unit. Electrical connections are internal wired. The cable which goes to the terminal box must be carry through the membran gaskets.

Mounting 4-level operation switch

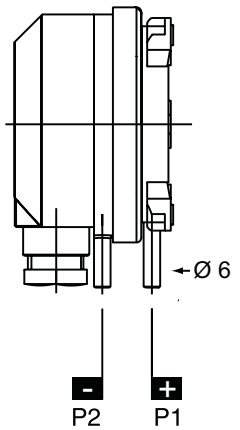
100 meters maximum lenght of the cable between 4-level operation switch and terminal box

- Mounting location:
  - the living quarters, circa 1,5 meters above the floor
  - on a internal wall
  - only for dry rooms

Differential pressure switch DDS (optional)

1. Mounting

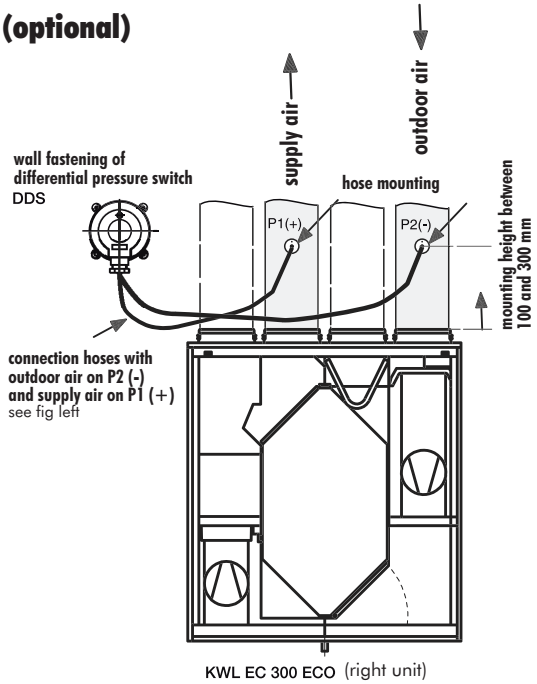
fig. : Connection of differential pressure switch



The differential pressure switch DDS is foreseen only for the use in air handling installations with fixed air intake and extract valves.
The connection of DDS and signal lamp must be wired on site!

a) The installation of the DDS must be vertical to the wall with the pressure connections showing downwards
b) The pipe connections of the DDS must be connected to the air duct. In this case the openings are to be sealed professionally. The pressure connection P2 (-) is carried out at the outside air duct, the pressure connection P1(+) at the intake air duct.

c) Electrical connection see page 10.


supply air
outdoor air
wall fastening of differential pressure switch DDS
hose mounting
P1(+)
P2(-)
mounting height between 100 and 300 mm
connection hoses with outdoor air on P2 (-) and supply air on P1 (+)
see fig left

KWL EC 300 ECO (right unit)

2. Function

The differential pressure switch DDS monitors the pre-installed outside air filter G4 and the optional usable pollen filter F7 (intake air). It monitors the static pressure loss between outside air and intake air duct.

If the air flow volume is reduced due to dirty filters, the pressure loss decreases between the two measuring points (In the extreme case at $\dot{V}=0 \Rightarrow \Delta p=P1-P2=0$).

A filter signal, for example a signal lamp can be build on site.

3. Adjustment

The following conditions must be fulfilled:
1. The system is installed and air flow volume $\dot{V}$ is set.
2. Switch position of DDS on 3/1 (see wiring diagram SS-857.1, page 10).
3. Set KWL EC 200 Eco unit on middle speed step.

Turn adjustment knob at the DDS (+/-) until switching point responds. Now read the switching point and reduce by approx. 15% (e.g. 100 Pa $\Rightarrow$ setpoint 85 Pa). As soon as the pressure drops below 85 Pa, the filter signal (build on site) control responds.

Bypass function

Adjustment is carried out via mechanical bypass flap. Open or closed manually. The outside air is passed by the counter flow heat exchanger at 100% and thus the heat recovery is stopped.

manual bypass function

Defrost function of heat recovery cell

To protect the heat recovery cells from freezing, the supply air fan was switch off temporary by the measured data of the frost protection sensor.

Maintenance display

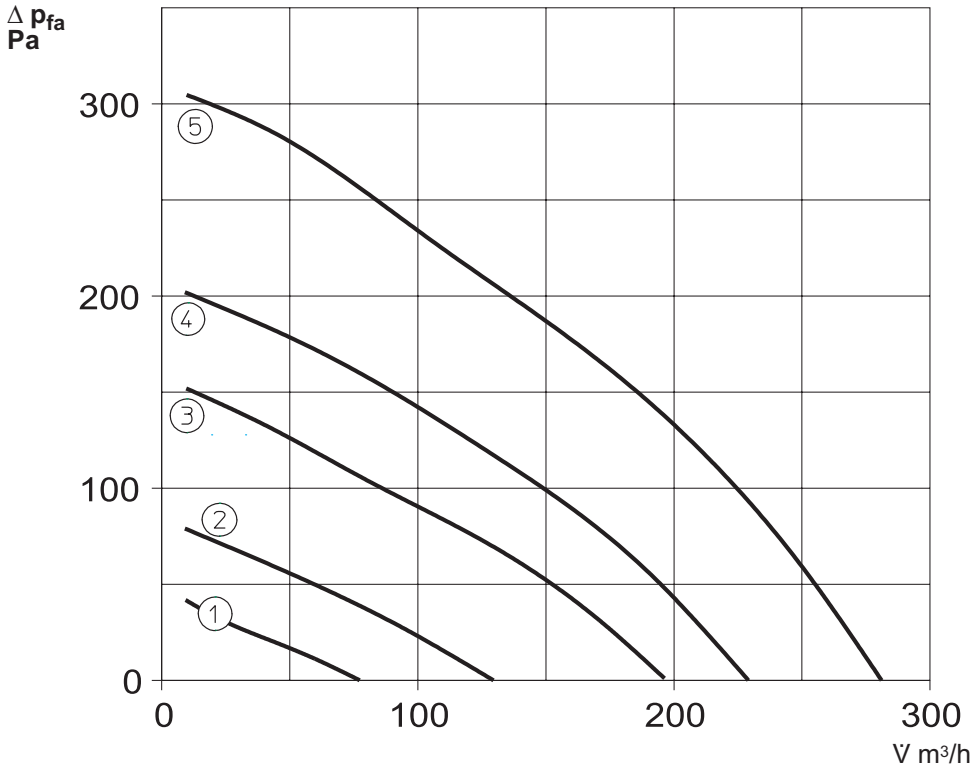
Adjustment and control is effected via differential pressure switch DDS (see wiring SS-857.1). The differential pressure switch DDS is a complete kit to monitor air filter, system pressure and fan operation. The filter state is indicated over a signal lamp (build on site). In that case the filters must be cleaned or exchanged.

Part list KWL EC 200 Eco

Code	Name	Technical details (factory settings in parenthese)	Equipment
G4 F7 G4	Filter	Extract air G4 Supply air F7 (optional) Outdoor air G4	Standard Accessory
	4-level operation switch	Adjustment, operation	Standard
	Heat recovery cell		Standard
	Extract air fan		Standard
	Frost protection sensor	Adjustment range -6 °C... +15 °C (WT)	Standard
	Supply air fan		Standard

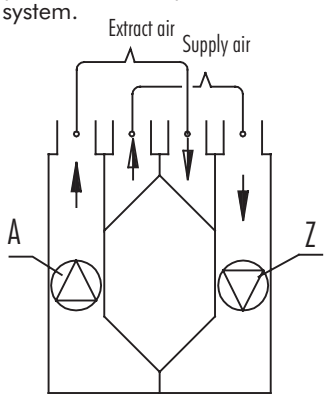
PERFORMANCE

Fan performance



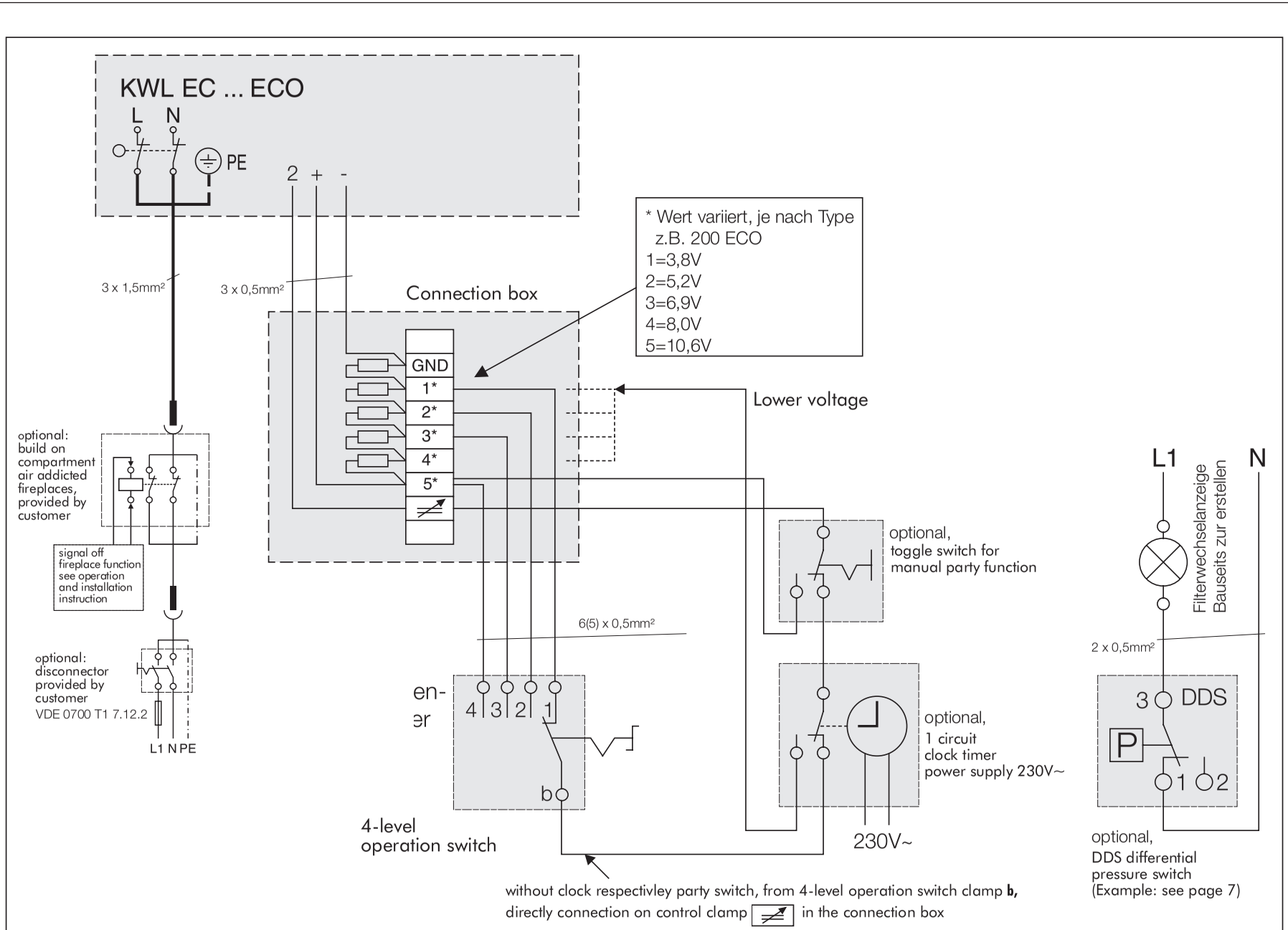
KWL EC 200 Eco measuring points

Measuring points after the spigots. The performance curves indicate the available total pressure for the pressure loss in the duct system.



R-Model

Adjustment range	Total input power (both fans)
1	14 W
2	22 W
3	42 W
4	62 W
5	98 W



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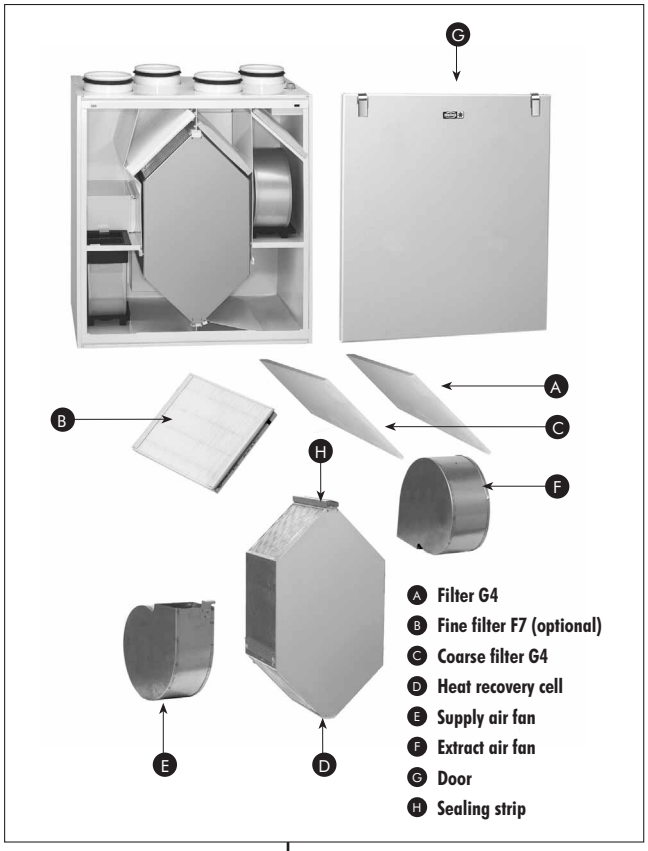
MAINTENANCE

ATTENTION: All work only in dead state! Before maintenance an isolator is required for with a minimum of 3 mm contact opening of each pole. Electrical connection should only be carried out by a qualified person.

Filter and heat recovery cell

- When the Maintenance reminder turns on the indicator lamp in the 4-level operation switch, check the filters. Outdoor air is filtered in the unit with two separate filters. A coarse filter (A) of class G4 filters off insects, rough pollen and other dust. A fine filter (B) of class F7 filters off invisible dust. Extract air is filtered with a filter (C) of class G4.
- Clean the coarse filters (A and C) by washing them at least twice a year.
- When you open the door of KWL EC 200 Eco, the security switch turns voltage off. Filters can now be pulled out. Wash the coarse filters with +25…30 °C warm water and washingup liquid, pressing them smoothly. Do not handle the filters with force. When washing is done properly, filters stand cleaning 4…5 times. In other words, you have to replace them at least every years or when needed.
- The fine filter is not washable. Clean it at the same time as the coarse filters, using the brush nozzle of a vacuum cleaner. When cleaning, be careful no to break filter material. To ensure good supply air quality, replace the filter at least once a year or more often, depending on local air quality. It is recommended to replace filters in the autumn. This way the filters stay cleaner through the winter and can effectively filter off dust in the following spring.
  Filters can be ordered via internet: www.ersatzluftfilter.de



- Ilt is also recommended to check the cleanliness of the cross-counter heat exchanger in connection with filters about every 2-years. Handle the thin fins carefully, because they could bend easily. If the exchanger is contaminated, soak it in a solution of water. Rinse the exchanger with a jet of water. Pay attention, that no wetness remains inside of the cross-counter heat exchanger before installation. If the cell is contaminated, soak it in a solution of water and washing up liquid. Rinse the cell clean with a jet of water.
  When all the water has drained from between the laminas, put the cell back in place. Lift the cell while pushing it in place. For this pull out the sealing strip. Lift and push at the same time the exchanger and place it on the sealings below. Insert sealing strip again and check fit of sealing.

Fans

- Check the fans at least every year of pollution or if necessary clean them. Use a small brush an cathartic against rich. Take care! Do not let water flow to the motor parts. Dry the fans before mounted them into the unit!
- The supply and extract air fans (E and F) have been fastened with rubber collars. When removing the fans for maintenance, release the ear fixed to the fan over the collar flange by bending it upwards. Remove the rubber collar from the opening and turn the fan so that it can be removed. Remove the plug behind the fan. Clean the fan blades with compressed air or with brush. Each blade has to be so clean that the fans stay balanced. Take care not to remove the balancing pieces attached to the fan blade.
- If you use water in cleaning, do not let it flow to the electrical parts.

Condsensing water outlets

- During the heating season, humidity of extract air condenses to water. Water formation can be abundant in new buildings, during baths and when wet clothes are being aired.
- Condensing water needs to flow out from the ventilation unit without hindrance. In connection with maintenance, e.g. in the autumn before the beginning of the heating season, make sure that the condensing water outlet in the bottom reservoir is not clogged. You may check it by pouring a little water in the reservoir. Do not let water flow to the electrical parts.

Other cleaning

In connection with maintenance, also check the internal cleanliness of the unit: preheating and post-heating resistors, bottom reservoir and internal casing. Remove dirt with a vacuum-cleaner, brush, damp cloth, etc. It is absolutely forbidden to run water into the electrical devices.

Air entrance valves / air outlet valves

Valves must be cleaned each year.

Outdoor air vent

Grills must be cleaned each year from leafs or other objects by in-coming air.

Accessories

The use of accessories not recommended or provided by HELIOS is not permitted.
Damage arising from such usage is not covered by the guarantee.

Warranty – Exclusion of liability

If the preceding instructions are not observed all warranty claims are void. The Helios warranty is limited to the material and workmanship of the product.

Certificates

If installed correctly the product complies with relevant European standards and regulations as at the time of its manufacture.

OPERATION FAILURES / ALARMS

	SYMTOM	CAUSE	METHODE/DO THIS
1	**Outdoor air cool when entering the house.**	• Air cools down in the attic ducts. • The heat recovery cell has frozen, and extract air cannot heat outdoor air. • The extract air filter or the cell is clogged.	• Check the insulation of the attic ducts. • Check the cleanliness of the filters and the heat recovery cell.
2	**The unit is deaf, the fans do not rotate, and none of the indicator lamps of the control panel is lit.**	• The door switch may be broken or has not closed properly. • The socket is dead; the fuse may have burned out, for instance.	• Check the door switch and the fuses. The unit has a glass tube fuse, T800mA. • If needed, contact a service representative (in order to check the glass tube fuse, for instance).

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